

Spatial Distribution and Analysis of Crime in Haryana: A Geographical Perspective

Amandeep Gahlawat

Research Scholar, Baba Mastnath University, Asthal Bohar, Rohtak, Haryana, India

Received: 22 Jan 2025; Received in revised form: 19 Feb 2025; Accepted: 25 Feb 2025

©2025 The Author(s). Published by TheShillonga. This is an open-access article under the CC BY license

(<https://creativecommons.org/licenses/by/4.0/>)



Abstract— The present research explores the regional patterns and intensities of IPC crimes across the districts of Haryana over ten years from 2013–14 to 2023–24. Utilizing official data from the NCRB and Statistical Abstracts of Haryana, the analysis highlights the uneven distribution of crime rates across the state. Districts such as Gurugram, Faridabad, Hisar, Karnal, and Panipat have emerged as high-crime zones, recording substantial increases in total IPC cases. Urbanization, population density, socio-economic changes, and improved reporting mechanisms are identified as key factors contributing to the rise. Conversely, districts like Bhiwani and Nuh show comparatively lower increases, though underreporting may be a factor. The use of geographical tools and spatial mapping brings clarity to the concentration and spread of criminal activity, aiding in the identification of crime hotspots. This spatial analysis underscores the importance of localized policing, preventive planning, and socio-economic interventions in curbing crime. The findings provide valuable insights for policymakers, law enforcement agencies, and researchers to devise data-driven strategies tailored to district-specific crime trends, thereby enhancing public safety and governance efficiency across Haryana.

Keywords— Population Density, Law Enforcement, Policy Makers.

I. INTRODUCTION

Understanding crime through a geographical lens is a crucial approach in modern social science, particularly when examining patterns across a rapidly transforming region like Haryana. The spatial distribution and analysis of crime offer deeper insights into where crimes occur, why certain regions experience higher incidences than others, and how socio-economic, infrastructural, and urbanization factors contribute to crime rates. Haryana, located in northern India, has seen dynamic changes in its economic, social, and demographic structure over the past few decades. With 22 districts encompassing both densely urbanized areas, such as Gurugram and Faridabad, and traditionally agrarian regions like Jind, Hisar, and Rohtak, Haryana provides a rich landscape to study the spatial dimensions of crime.

Recent statistics have highlighted interesting trends in Haryana's crime scenario. For example, as per the Haryana Police Department and the National Crime Records Bureau (NCRB), there was a 14.62% reduction in overall FIRs registered in the state in 2024 compared to 2023. This includes a decline in heinous crimes such as murder

(down by 8.9%), rape, and dowry deaths. Despite these improvements, crimes against women remain a major concern, with over 9,488 cases registered in 2024 alone. Districts like Sonapat, Rohtak, Jhajjar, Hisar, Gurugram, and Mewat have consistently reported higher rates of violence against women, theft, and property-related crimes. These trends suggest that crime in Haryana is not uniformly distributed but is concentrated in specific urban or semi-urban clusters, often near transport hubs, industrial belts, or rapidly urbanizing zones. This uneven distribution forms the basis for a geographical analysis that can explain spatial patterns and recommend targeted interventions.

Spatial analysis helps uncover such clusters of crime, termed "hotspots," by using techniques like Geographic Information Systems (GIS), Kernel Density Estimation (KDE), and spatial autocorrelation (e.g., Moran's I). These tools provide the ability to map, visualize, and analyze crime data at the district, block, or ward level. For instance, GIS mapping of crime data in Gurugram may reveal that most thefts and assaults occur near transportation corridors, market areas, or poorly lit suburban settlements. Similarly, KDE techniques could identify high-density crime zones in Rohtak or Faridabad,

helping authorities deploy resources more effectively. These spatial methods are supported in Haryana by organizations like the Haryana Space Applications Centre (HARSAC), which offers remote sensing and GIS services and could significantly enhance the study and mapping of crime across the state.

The necessity of spatial crime analysis in Haryana is underscored by the state's unique geographical and socio-economic fabric. It shares borders with high-crime zones such as Delhi and western Uttar Pradesh, making inter-state crime spillover a persistent issue. Moreover, rapid urbanization in cities like Gurugram, where real estate and population growth have outpaced infrastructure and law enforcement expansion, contributes to increased crime rates. Migrant labor populations, unequal wealth distribution, and the decline of traditional joint-family structures have also influenced the social environment, sometimes contributing to property crimes, youth delinquency, and gender-based violence. In rural belts, issues such as caste-based violence, land disputes, and honor killings remain prevalent, showing a different spatial dimension of crime compared to urban centers.

From a policy and planning perspective, this geographical approach is highly valuable. By identifying specific high-crime localities, government and police authorities can implement targeted safety measures such as increasing street lighting, installing CCTV surveillance, improving road networks, and strengthening local police stations. For instance, recent efforts like "Operation Akraman" by the Haryana Police, focused on organized crime and gang networks, were more effective in areas with clearly mapped crime histories. Similarly, mapping areas where crimes against women are more frequent can lead to safer public transport routes, emergency call points, and enhanced community policing programs.

Another dimension of spatial analysis includes temporal comparisons—studying how crime patterns shift over time. For instance, crime might rise during harvest seasons due to higher liquidity in rural areas or an increase in theft cases during festive periods in urban zones. Tracking such changes across multiple years allows for dynamic policing strategies and the development of predictive models. Moreover, linking crime data with socio-economic indicators such as literacy, poverty rates, employment, and gender ratio helps in understanding the root causes of crime. For example, districts with lower female literacy rates often show higher incidences of domestic violence and harassment, while industrial zones with higher migrant populations might report more instances of theft or substance abuse-related crimes.

Data sources for such a study include the Crime and Criminal Tracking Network & Systems (CCTNS), district-level NCRB data, police department reports, and spatial datasets from HARSAC. The integration of these diverse datasets enhances the validity of spatial analysis and allows for district-wise comparisons. Districts such as Gurugram, Faridabad, Rohtak, Karnal, Hisar, and Panipat often show higher overall crime rates, especially in terms of theft, assaults, and crimes against women. Meanwhile, districts like Rewari, Mahendragarh, or Charkhi Dadri typically report lower incidents, though certain categories of crime may still be prevalent. These patterns suggest that both absolute numbers and relative rates (per lakh population) must be considered to accurately assess crime intensity.

Significance of the Study: -

The study of the *Spatial Distribution and Analysis of Crime in Haryana: A Geographical Perspective* holds immense academic, administrative, and social significance. As crime continues to be a major concern in both urban and rural regions of Haryana, a geographical analysis provides deeper insights into the spatial patterns and concentrations of different types of crimes. Unlike traditional crime statistics that present aggregated figures, this spatial approach focuses on the 'where' and 'why'—helping to identify crime hotspots, understand underlying socio-economic and infrastructural conditions, and guide more effective policing and urban planning. Haryana, being a rapidly urbanizing state bordering the National Capital Territory of Delhi, faces unique challenges. Districts like Gurugram, Faridabad, Sonapat, and Rohtak have emerged as high-crime zones due to factors like population influx, industrial growth, and migration. Through spatial analysis tools such as GIS (Geographic Information Systems), crime density maps, and spatial autocorrelation techniques can pinpoint clusters of violent crimes, theft, and gender-based violence. This can support state authorities in deploying targeted law enforcement and resource allocation strategies.

Furthermore, the study is significant for policymaking. It offers valuable insights to urban planners, law enforcement agencies, and social welfare departments, enabling them to create safer environments through improved surveillance, infrastructure, and community engagement. Academically, it contributes to criminology, human geography, and public policy by combining spatial science with social analysis. Overall, this research aids in understanding the complex geography of crime in Haryana and serves as a practical framework for reducing crime through localized, data-driven interventions.

44,212 square kilometers, Haryana comprises 22 districts and is administratively divided into six divisions: Ambala, Rohtak, Hisar, Gurugram, Karnal, and Faridabad. As per the Census of India 2011, Haryana had a population of over 2.53 crore, which is estimated to have grown to over 2.9 crore by 2024.

Haryana is one of India's most economically advanced states, with a high level of industrialization, especially in districts like Gurugram, Faridabad, and Panipat. However, the state also has a significant rural base, with around 65% of the population living in villages. The literacy rate stands at 75.55%, and the sex ratio, though improving, was 929 females per 1,000 males as per the 2011 Census.

Due to its rapid urbanization, proximity to Delhi, and growing industrial landscape, Haryana faces varied challenges in crime management. This makes it an ideal case for spatial crime analysis, as it features a diverse mix of rural-urban dynamics, socio-economic conditions, and administrative structures.

Objectives: -

- i. To examine the spatial distribution of crime across various districts of Haryana.
- ii. To study the temporal variation in crime patterns.

II. RESEARCH METHODOLOGY

The present study is based entirely on secondary data sources. The secondary sources of data include the Statistical Abstract of Haryana, published by the Department of Economic and Statistical Analysis, Government of Haryana, and the National Crime Records Bureau (NCRB), Haryana. These official datasets provide comprehensive and reliable information on various categories of crime at the district level, including trends over time. The methodology involves collecting district-wise crime data such as murder, theft, rape, robbery, kidnapping, dowry deaths, and crimes against women and children. Spatial tools such as Geographic Information System (GIS) will be used to map the distribution of crime and identify hotspots across Haryana's 22 districts. Statistical techniques, including percentage analysis and comparative ranking, will help interpret crime intensity and patterns. The results will be visualized through thematic maps, bar charts, and tables to ensure a clear geographical understanding of crime dynamics in the state.

III. RESULTS AND DISCUSSIONS

A critical component of the research process is the examination and interpretation of data. This stage involves evaluating collected data to extract meaningful insights,

commonly referred to as analysis. However, analysis and interpretation are deeply interconnected, functioning in a mutually dependent manner where one cannot progress effectively without the other.

Initially, analysis focuses on systematically reviewing raw data to uncover patterns, relationships, and trends. Yet, without the subsequent step of interpretation, such analytical work remains incomplete, lacking the essential contextual framework needed to derive valid and relevant conclusions. Thus, both elements are essential for producing coherent and impactful research findings.

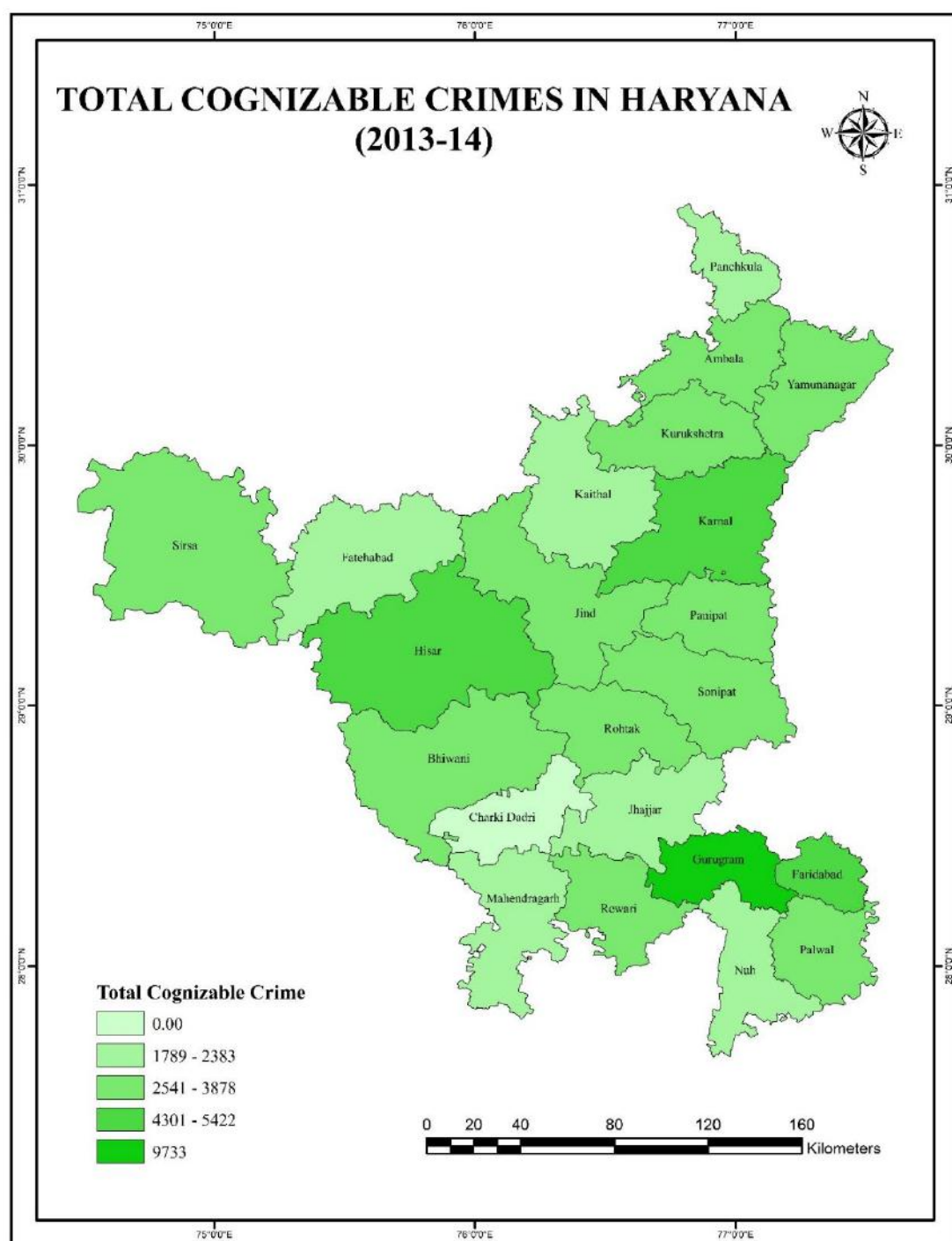
Table No. 1: Total IPC Crimes in Haryana (2013-14), (2023-24)

Sr. No.	Districts	Total Cognizable Crime (2013-14)	Total IPC Crime (2023-24)
1.	Ambala	3365	4892
2.	Bhiwani	3878	4019
3.	Charkhi Dadri	-	1539
4.	Faridabad	5264	10294
5.	Fatehabad	1999	3440
6.	Gurugram	9733	15863
7.	Hisar	5422	10136
8.	Jhajjar	2028	3695
9.	Jind	2923	4175
10.	Kaithal	1804	3367
11.	Karnal	4301	9805
12.	Kurukshetra	2638	4678
13.	Mahendragarh	1960	3389
14.	Nuh	2383	3011
15.	Palwal	2746	4299
16.	Panchkula	1789	3032
17.	Panipat	3294	8003
18.	Rewari	2695	3910
19.	Rohtak	3103	6358
20.	Sirsa	2825	5426
21.	Sonipat	3570	7040
22.	Yamunanagar	2541	5850

Source: Statistical Abstract of Haryana, 2023-24
- Data not available

The comparative analysis of crime statistics in Haryana from 2013–14 to 2023–24 offers a crucial insight into the evolving pattern of cognizable crimes under the Indian Penal Code (IPC) across the districts. The dataset reveals significant shifts in crime rates, both in absolute and percentage terms, indicating socio-economic and administrative dynamics influencing public safety and law enforcement across the state.

Among all districts, Panipat emerges as a district with the highest percentage increase in IPC crimes, registering a 142.96% rise from 3,294 cases in 2013–14 to 8,003 in 2023–24. This steep surge points towards either an actual rise in criminal incidents or improved crime reporting mechanisms. Similarly, Yamunanagar experienced a 130.22% increase, rising from 2,541 to 5,850 cases, suggesting a sharp escalation that demands focused criminological inquiry and enhanced policing.



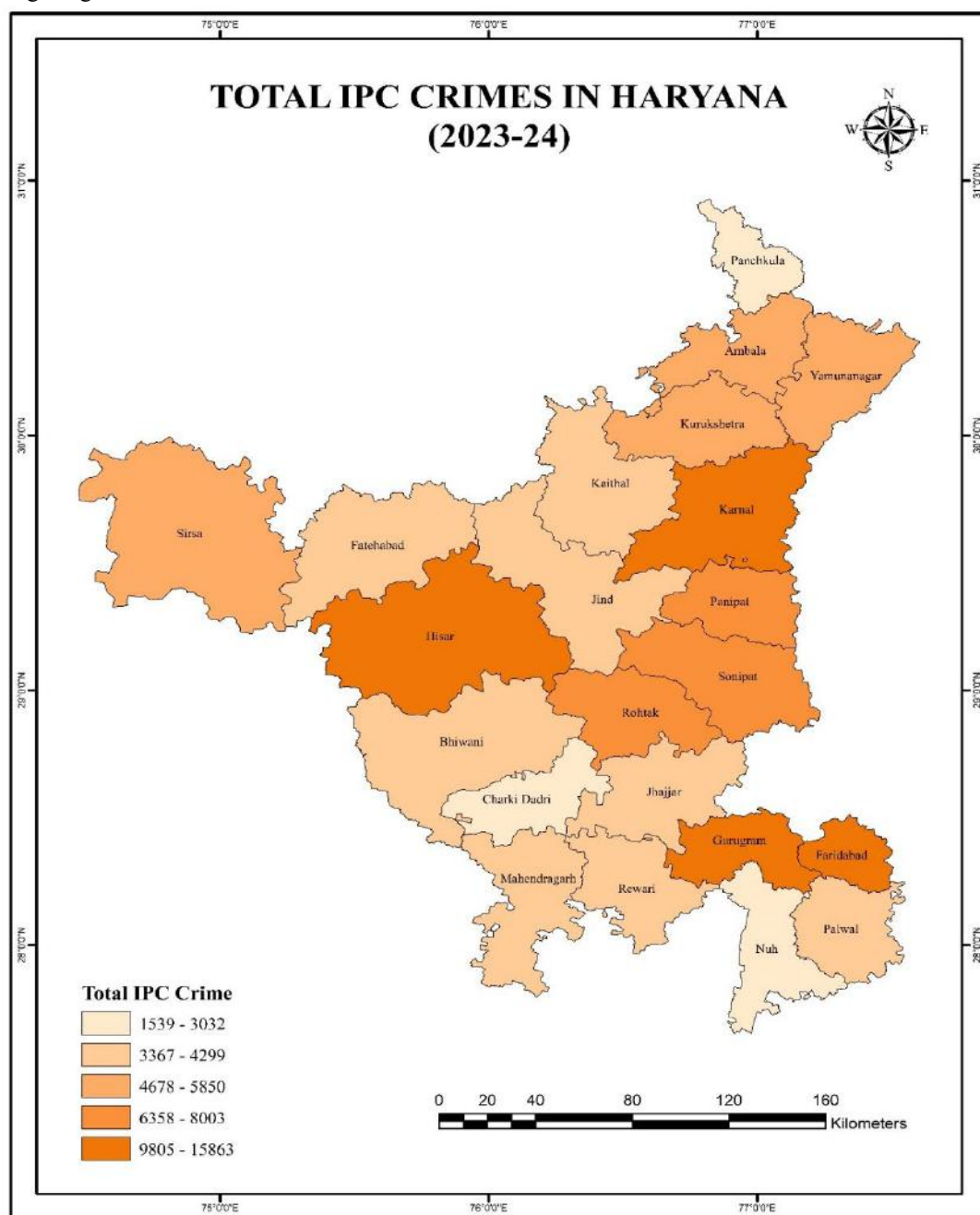
Map No. 2: Total IPC Crimes in Haryana (2013-14)

Source: Compiled by Researcher

Karnal, with a 127.97% growth, and Rohtak, with a 104.89% increase, also reflect alarming trends. These districts, located strategically on national highways and witnessing rapid urban growth, might be facing law-and-order challenges due to urbanization pressures, migration, and economic disparities. Meanwhile, Sonipat reported a near doubling of crime, with a 97.19% increase, indicating a need for urgent intervention.

Major urban centers such as Faridabad and Gurugram, while showing high absolute numbers—10,294 and

15,863, respectively—registered percentage increases of 95.55% and 62.98%, respectively. These cities are part of the National Capital Region (NCR) and have seen exponential population and infrastructure growth, possibly contributing to increased crime vulnerability. The data reflect both population stress and complex urban issues like property disputes, economic crimes, and gender-based violence.



Map No. 3: Total IPC Crimes in Haryana (2023-24)

Source: Compiled by Researcher

Other districts showing substantial increases include Sirsa (92.07%), Hisar (86.94%), Kaithal (86.64%), Jhajjar

(82.20%), and Kurukshetra (77.33%). This collective rise across rural and semi-urban districts suggests that crime is

not solely an urban phenomenon. Rising unemployment, agrarian stress, and digital fraud might be new-age contributors even in less urbanized regions.

On the other hand, districts like Nuh (26.35%) and Bhiwani (3.64%) exhibit minimal increases. However, these numbers may be deceptive. In regions like Nuh, known for socio-economic backwardness and literacy gaps, under-reporting of crimes remains a concern, hinting at systemic issues in law enforcement and community engagement. Charkhi Dadri, newly created after 2016, cannot be compared due to a lack of baseline data from 2013–14.

Interestingly, Panchkula, although located near the capital Chandigarh and expected to have better administration, still saw a significant 69.48% increase. This anomaly necessitates further research into the types of crimes occurring there, whether they are property-related, cyber, or violent crimes, and the effectiveness of its urban governance.

In districts like Mahendragarh, Fatehabad, and Palwal, the increase hovers between 56% and 72%, reflecting moderate growth yet demanding improvements in policing, preventive strategies, and public awareness.

Overall, the state's crime rate trend underscores a marked increase across almost all districts. Out of 21 comparable districts, 20 show a positive change, and many have seen more than a 70% rise. This calls for a statewide strategic overhaul in crime prevention, including the implementation of smart policing, surveillance infrastructure, gender sensitization programs, and rural crime tracking.

The broad rise also opens questions regarding the socio-political context—whether better reporting systems, increased public awareness, or a real uptick in criminal activity drives these figures. The consistent upward trend highlights the importance of regional planning, socio-economic interventions, and more nuanced district-level crime mapping using GIS tools for spatial understanding.

From a geographical standpoint, this data could be visualized to identify hot spots and spatial crime clusters, aiding policy formulation and better governance. Districts in the NCR zone like Gurugram, Faridabad, and Sonapat need more immediate action due to both high density and complex urban dynamics, while central districts like Hisar, Rohtak, and Karnal are emerging as critical zones requiring infrastructural and institutional support.

IV. CONCLUSION

The spatial analysis of IPC crimes across Haryana over ten years (2013–14 to 2023–24) reveals significant shifts in

crime patterns, highlighting both the growing complexity and regional disparities in criminal activities within the state. The study clearly shows that districts such as Gurugram, Faridabad, Hisar, Karnal, and Panipat have experienced sharp increases in total IPC crime cases, pointing to the influence of rapid urbanization, population influx, economic migration, and increasing social tensions. These districts, particularly those within the National Capital Region (NCR), face immense development pressure, infrastructural stress, and often suffer from governance gaps that contribute to rising crime levels. At the same time, comparatively lower increases in districts like Nuh and Bhiwani may reflect either better control or, more likely, underreporting due to administrative inefficiencies, low awareness levels, or social stigma. The analysis also reflects the importance of demographic, economic, and spatial factors in determining the vulnerability of a district to crime. Through this geographical approach, it becomes evident that crime is not uniformly distributed but concentrated in specific areas that require targeted intervention.

The conclusion drawn from this research emphasizes the urgent need for region-specific policy measures and smarter policing strategies. It advocates for the integration of spatial data analysis into crime monitoring and urban planning to enhance real-time decision-making and resource allocation. Moreover, the study calls for strengthening the socio-economic fabric of vulnerable regions through education, employment generation, and community policing. In essence, addressing crime in Haryana demands a balanced approach that combines technological tools, socio-political reforms, and geographical insights to ensure long-term safety and equitable development across all districts.

REFERENCES

- [1] Ahlawat and Kumar. (2013). Crime against Women in Haryana: An Empirical Study. *Global Advanced Research Journal of Peace, Gender and Development Studies*.
- [2] Sahoo, H., & Pradhan, M. R. (2009). Domestic violence in India: An empirical analysis. *Man in India*, 89(3), 303–322.
- [3] Prasad, K. (2013). A comparison of victim-reported and police-recorded crime in India. *Economic & Political Weekly*, 48(33), 47–53.
- [4] Vicente, G., Goicoa, T., Fernandez-Rasines, P., & Ugarte, M. D. (2020). Crime against women in India: Unveiling spatial patterns and temporal trends of dowry deaths in the districts of Uttar Pradesh. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 183(2), 655–679.
- [5] Prakash, N., & Vadlamannati, K. C. (2019). Girls for sale? child sex ratio and girl trafficking in India. *Feminist Economics*, 25(4), 267–308.